DRAFT FINAL
EXPANDED ENGINEERING EVALUATION/COST ANALYSIS (EEE/CA)
FOR THE
McLAREN TAILINGS SITE
COOKE CITY, MONTANA

Engineering Services Agreement DEQ/MWCB 401027
Task Order Number 05

Prepared for:

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6.0 RECLAMATION OBJECTIVES AND GOALS

6.1 ARAR-BASED RECLAMATION GOALS

6.1.1 Surface Water

Maximum Contaminant Levels, Acute Aquatic Life Standards and Human Health Standards (HHSs) are common ARARs for the surface water medium. The more stringent of the two standards is identified as the ARAR-based reclamation goal; acute rather than chronic aquatic life standards are appropriate since long-term monitoring data are not available to assess chronic exposure. The potential COCs at the McLaren Tailings site are: Cd, Cu, Fe, Hg, and Ag. No exceedances of State or Federal ARARs were found at the site for surface water.

6.1.2 Groundwater

Groundwater data were collected at the site in 1993. These results indicated that COC concentrations in local groundwater exceed secondary drinking water standards for Fe and Mn; no exceedances of primary MCLs were found. The ARAR-based reclamation goals for groundwater are most often the MCLs, non-zero maximum contaminant level goals (MCLGs), or State drinking water standards, whichever are more stringent.

6.1.3 Soil

Chemical-specific ARARs are not available at this time for the soil medium.

6.2 RISK-BASED CLEAN UP GOALS

Previously calculated risk-based clean up goals for both the carcinogenic and non-carcinogenic estimates of human health risk are applied for two land-use scenarios at the McLaren Tailings Site, recreational and residential. These concentrations were derived using exposure assumptions contained in other documents (Residential-Smith, 1999; Recreational-TetraTech, 1996) and are the same as those presented in Section 5.1. Both sets of clean up goals attempt to reduce the risk of excess incidence of cancer to 1.0E-06 (EPA, 1990) and the non-carcinogenic HQ to $\Uparrow$1 (EPA, 1989a). Both sets of clean up goals are presented on Table 6-1.

Risk reduction required to attain non-carcinogenic human health and ecologic reclamation goals for each COC (by each pathway) is shown on Table 6-2.

TABLE 6-1
PROPOSED CLEAN UP GOALS FOR THE McLAREN TAILINGS SITE

Contaminant of Concern	Recreational Soil Ing./Inh. mg/Kg	Recreational Water Ingestion µg/L	Residential Dust Inhalation mg/Kg	Residential Soil Ingestion mg/Kg	Residential Water Ingestion µg/L
Cd	1,750 22 (Carc.)	256	140,000 920 (Carc.)	39	18
Cu	54,200	18,900	NA	3,100	1,500
Fe	NA	NA	NA	23,000	11,000
Hg	440	153	7	23	11
Ag	NA	NA	NA	390	180

NA = Not Applicable, concentration is more than unity.
mg/Kg = milligrams per kilograms
µg/L = micrograms per Liter

TABLE 6-2
RISK REDUCTION NECESSARY TO ATTAIN NON-CARCINOGENIC HUMAN HEALTH AND ECOLOGIC CLEAN UP GOALS

PATHWAY	RISK REDUCTION (%)				
	Cd	Cu	Fe	Hg	Ag
Human Health Exposure Pathways					
Soil Ingestion (Res.)	--	59.2	91.4	--	--
Water Ingestion (Res.)	--	--	88.6	--	--
Soil Ing/Inh (Recr.)	--	--	--	--	--
Water Ingestion (Recr.)	--	--	--	--	--
Ecological Exposure Pathways					
Surface Water	--	--	--	--	--
Sediments	--	--	--	--	--
Plant Phytotoxicity	51.2	98.4	--	--	--

-- = Risk reduction not required for the contaminant for that pathway.